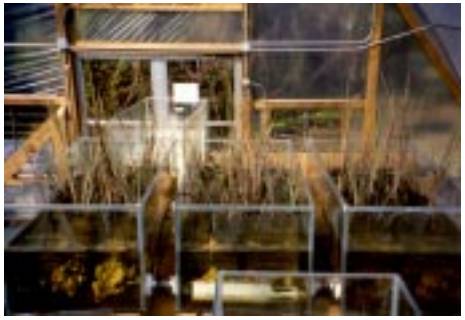
Marine Ecotoxicology Overview

Interdisciplinary research focused on identifying chemical and bacterial contaminants associated with agriculture, urbanization, dredging operations, and industrial discharges and their resulting toxicological and ecological impacts on marine and estuarine ecosystems.



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Marine Ecotoxicology Branch

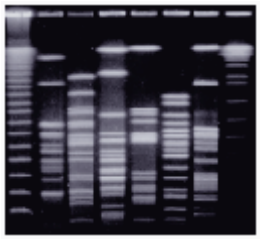
Center for Coastal Environmental Health & Biomolecular Research

Research Areas

Toxicology & Physiology

Focused on understanding the effects associated with environmental contaminants in estuarine ecosystems with an emphasis on the development of sub-lethal indicators (biomarkers) of contaminant exposure and stress.

Environmental Microbiology



Developing methods to distinguish human vs. animal sources of bacterial contamination.

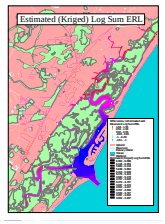
Chemical Contaminants

Chemical analysis of environmental samples for field / laboratory toxicity studies and development of new analytical techniques for environmental samples.

Ecotoxicology

Conducts ecological research on anthropogenic influences in coastal zone. Re-establish linkages natural and marine environments.

Develops mathematical and visual models of both perturbations to estuarine systems and of pharmacological responses to xenobiotics in sentinel organisms.



Toxicity Testing

- Test Species:
  microbial food web assessment, phyto plankton, zooplankton, meiobenthos, bivalves, shrimp, fish.
- Endpoints: mortality, reproduction, development, growth / productivity, metabolism.
- Types of Assays:
  aquatic, sediment, trophic transfer.
- Biomarkers:
  specific and nonspecific.

Mesocosm Testing

- Simulated salt-marsh ecosystem
- Applications of environmental biomarkers.
- Integration of single-species toxicity testing with field testing and monitoring data.
- Dredge spoil and bioremediation assessments.

Field Testing & Monitoring

- Collection and analysis of surface waters, sediments, and tissue samples for the presence of contaminants associated with urbanization and agriculture.
- Field deployment / assessment of bioassay organisms.

Analytical Capabilities

Quantification of persistent (PAHs, PCBs) and nonpersistent (organophosphates, organochlorines) organic compounds and trace metals in sediments, tissues, semipermeable membrane devices and water.
Instrumentation: includes ICP, GC-ECD, AA, GC-NPD, GC/MS and HPLC.